What is claimed is:

I claim:

1) A method of tuning a block resonator filter, comprising the steps of:

tuning at least one resonant frequency of said block resonator filter.

2) The method according to claim 1, wherein said step of tuning at least one resonant frequency comprises:

cutting a slot within a face of said block resonator filter.

3) The method according to claim 1, wherein said step of tuning at least one resonant frequency comprises:

tuning a resonant frequency of a particular mode to a higher frequency by removing small circular areas of a conductive surface from a face of said block resonator filter.

4) The method according to claim 1, wherein said step of tuning at least one resonant frequency comprises:

using at least one tuning cylinder among a plurality of orthogonal faces of said block resonator filter to tune said filter.

5) The method according to claim 1, wherein said step of tuning at least one resonant frequency comprises grinding areas on a plurality of orthogonal faces of said block resonator filter to change the resonant frequencies of modes in said block.

6) The method according to claim 2, wherein said step of cutting a slot comprises cutting a slot along the X-direction on a X-Z face of said block resonator filter.

7) The method according to claim 2, wherein said step of cutting a slot comprises cutting a slot along the X-direction on a X-Y face.

8) The method according to claim 2, wherein said step of cutting a slot comprises cutting a slot along the Y-direction on a X-Y face.

9) The method according to claim 2, wherein said step of cutting a slot comprises:
cutting a slot along the X-direction on a X-Z face;
cutting a slot along the X-direction on a X-Y face; and.
cutting a slot along the Y-direction on a X-Y face.

10) The method according to claim 2, wherein said step of cutting a slot comprises cutting a slot on orthogonal faces of said block resonator filter.

11) The method according to claim 2, further comprising the steps of:
exciting a plurality of modes; and
coupling said modes.

12) The method according to claim 3, wherein said step of removing small circular areas comprises cutting away successive circles from a face of said block resonator filter.

13) The method according to claim 3, wherein said step of removing small circular areas comprises cutting away successive circles from a X-Y face of said block resonator filter.

14) The method according to claim 3, wherein said step of removing small circular areas comprises cutting away successive circles from a X-Z face of said block resonator filter.

15) The method according to claim 3, wherein said step of removing small circular areas comprises cutting away successive circles from a Y-Z face of said block resonator filter.

16) The method according to claim 3, wherein said step of removing small circular areas comprises:
cutting away successive circles from a X-Y face of said block resonator filter;

cutting away successive circles from a X-Z face of said block resonator filter; and

cutting away successive circles from a Y-Z face of said block resonator filter.

17) The method according to claim 3, wherein said step of removing small circular areas comprises cutting away successive circles from more than one orthogonal face of said block resonator filter.

18) The method according to claim 3, further comprising the steps of:

exciting a plurality of modes; and

coupling said modes.

19) The method according to claim 4, wherein said at least one tuning cylinder is distributed among three orthogonal faces of said block resonator filter.

20) The method according to claim 4, wherein said at least one tuning cylinder is a metallic element.

21) The method according to claim 4, wherein said at least one tuning cylinder is a dielectric element.

22) The method according to claim 5, further comprising the steps of:

exciting a plurality of modes; and

coupling said modes.

23) The method according to claim 11, wherein said step of coupling said modes comprises cutting at least one corner of said block.

24) The method according to claim 11, wherein said step of exciting a plurality of modes, comprises using a probe to radiate energy into and out of said block resonator filter.

25) The method according to claim 11, wherein said step of exciting a plurality of modes, comprises:

forming a hole in said block resonator filter;

plating an interior of said hole; and

fixing a connection from said plated hole to an external circuit.

26) The method according to claim 18, wherein said step of coupling said modes comprises cutting at least one corner of said block.

27) The method according to claim 18, wherein said step of exciting a plurality of modes, comprises using a probe to radiate energy into and out of said block resonator filter.

28) The method according to claim 18, wherein said step of exciting a plurality of modes, comprises:

forming a hole in said block resonator filter;

plating an interior of said hole; and

fixing a connection from said plated hole to an external circuit.

29) The method according to claim 23, wherein said at least one corner cut is oriented along mutually orthogonal axes.

30) The method according to claim 23, wherein said cutting at least one corner further comprises cutting along a Y axis, cutting along a Z axis and cutting along a X axis.

31) The method according to claim 23, wherein said step of exciting a plurality of modes, comprises:

forming a hole in said block resonator filter;

plating an interior of said hole; and

fixing a connection from said plated hole to an external circuit.

32) The method according to claim 26, wherein said at least one corner cut is oriented along mutually orthogonal axes.

33) The method according to claim 26, wherein said cutting at least one corner further comprises cutting along a Y axis, cutting along a Z axis and cutting along a X axis.

34) The method according to claim 26, wherein said step of exciting a plurality of modes, comprises:

forming a hole in said block resonator filter;

plating an interior of said hole; and

fixing a connection from said plated hole to an external circuit.

35) A filter assembly, comprising:

a block resonator filter comprising at least one tuning element for tuning at least one resonant frequency of said block resonator filter.

36) The filter assembly according to claim 35, wherein said tuning element comprises at least one slot within at least one face of said block resonator filter.

37) The filter assembly according to claim 35, wherein said tuning element comprises circular areas of conductive surface missing from at least one face of said block resonator filter.

38) The method according to claim 35, wherein said at least one tuning element comprises a cylinder distributed among more than one orthogonal face of said block resonator filter.

39) The method according to claim 35, wherein said tuning element comprises grinded areas on a plurality of orthogonal faces of said block resonator filter to change the resonant frequencies of modes in said block.

40) The filter assembly according to claim 36, further comprising:

a mask filter operably connected to said block resonator filter, wherein a passband of said premask filter is wider than a passband of said block resonator filter; and

a low-pass filter operably connected to said block resonator filter, wherein said low-pass filter rejects frequencies greater than the passband of said block resonator filter.

41) The filter assembly according to claim 36, wherein said slot is along a X-direction on a X-Z face of said block resonator filter.

42) The filter assembly according to claim 36, wherein said at least one slot comprises:

a slot along a X-direction on a X-Z face;

a slot along a X-direction on a X-Y face; and.

a slot along a Y-direction on a X-Y face.

43) The filter assembly according to claim 36, wherein said at least one slot comprises a plurality of slots on orthogonal faces of said block resonator filter.

44) The filter assembly according to claim 36, further comprising at least one corner cut.

45) The method according to claim 36, further comprising a probe to radiate energy into and out of said block resonator filter.

46) The method according to claim 36, further comprising:

a plated hole in said block resonator filter; and

a connection from said plated hole to an external circuit.

47) The filter assembly according to claim 37, further comprising:

a mask filter operably connected to said block resonator filter, wherein a passband of said mask filter is wider than a passband of said block resonator filter; and

a low-pass filter operably connected to said block resonator filter, wherein said low-pass filter rejects frequencies greater than the passband of said block resonator filter.

48) The method according to claim 37, wherein said small circular areas comprises successive circles cut away from a X-Y face of said block resonator filter.

49) The method according to claim 37, wherein said small circular areas comprises:
successive circles cut away from a X-Y face of said block resonator filter;
successive circles cut away from a X-Z face of said block resonator filter; and
successive circles cut away from a Y-Z face of said block resonator filter.

50) The method according to claim 37, wherein said small circular areas comprise successive circles cut away from more than one orthogonal face of said block resonator filter.

51) The filter assembly according to claim 37, further comprising at least one corner cut.

52) The method according to claim 37, further comprising a probe to radiate energy into and out of said block resonator filter.

53) The method according to claim 37, further comprising:
a plated hole in said block resonator filter; and
a connection from said plated hole to an external circuit.

54) The filter assembly according to claim 38, further comprising:
a mask filter operably connected to said block resonator filter, wherein a passband of said premask filter is wider than a passband of said block resonator filter; and
a low-pass filter operably connected to said block resonator filter, wherein said low-pass filter rejects frequencies greater than the passband of said block resonator filter.

55) The filter assembly according to claim 38, wherein said at least one tuning element is a metallic element.

56) The filter assembly according to claim 38, wherein said at least one tuning element is a dielectric element.

57) The filter assembly according to claim 38, further comprising at least one corner cut.

58) The filter assembly according to claim 38, further comprising a probe to radiate energy into and out of said block resonator filter.

59) The filter assembly according to claim 38, further comprising:

a plated hole in said block resonator filter; and

a connection from said plated hole to an external circuit.

60) The filter assembly according to claim 39, further comprising at least one corner cut.

61) The method according to claim 39, further comprising a probe to radiate energy into and out of said block resonator filter.

62) The method according to claim 39, further comprising:

a plated hole in said block resonator filter; and

a connection from said plated hole to an external circuit.